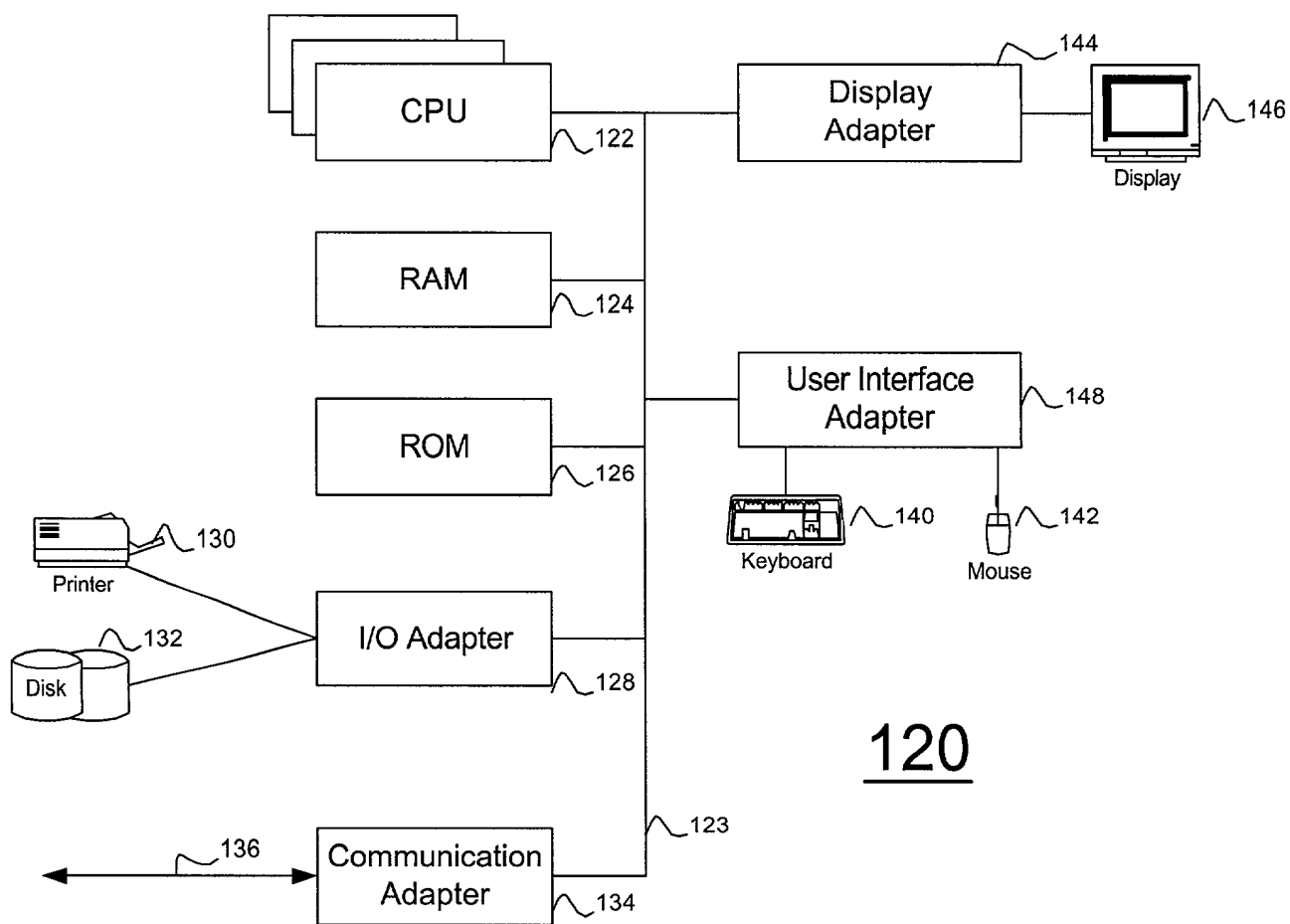


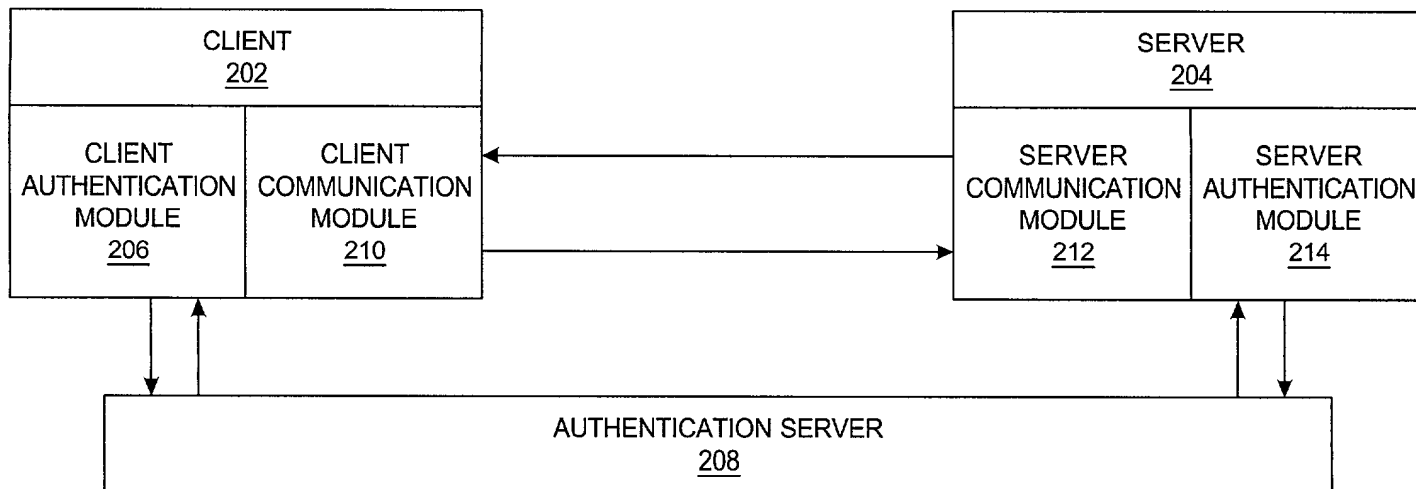
Prior Art
Figure 1A



Prior Art

Figure 1B

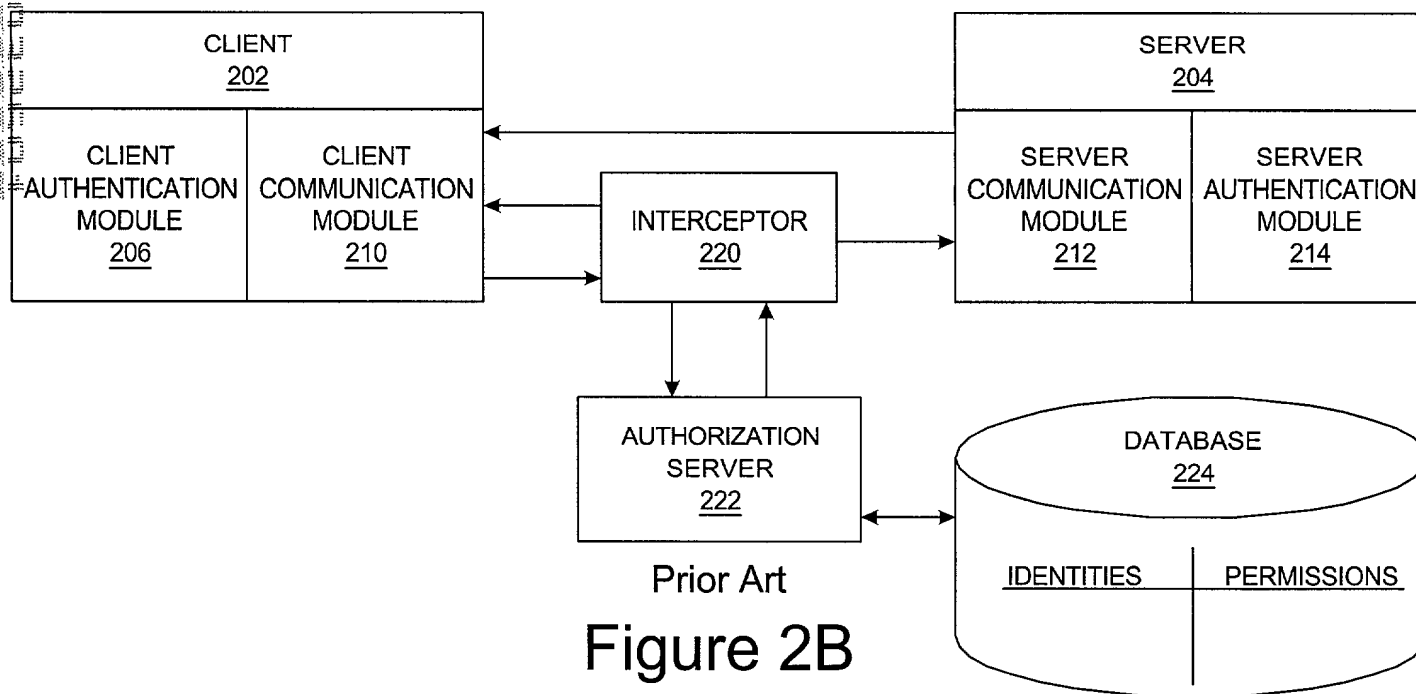
200

3/11
AUS920010044US1

Prior Art

Figure 2A

200



Prior Art

Figure 2B

300

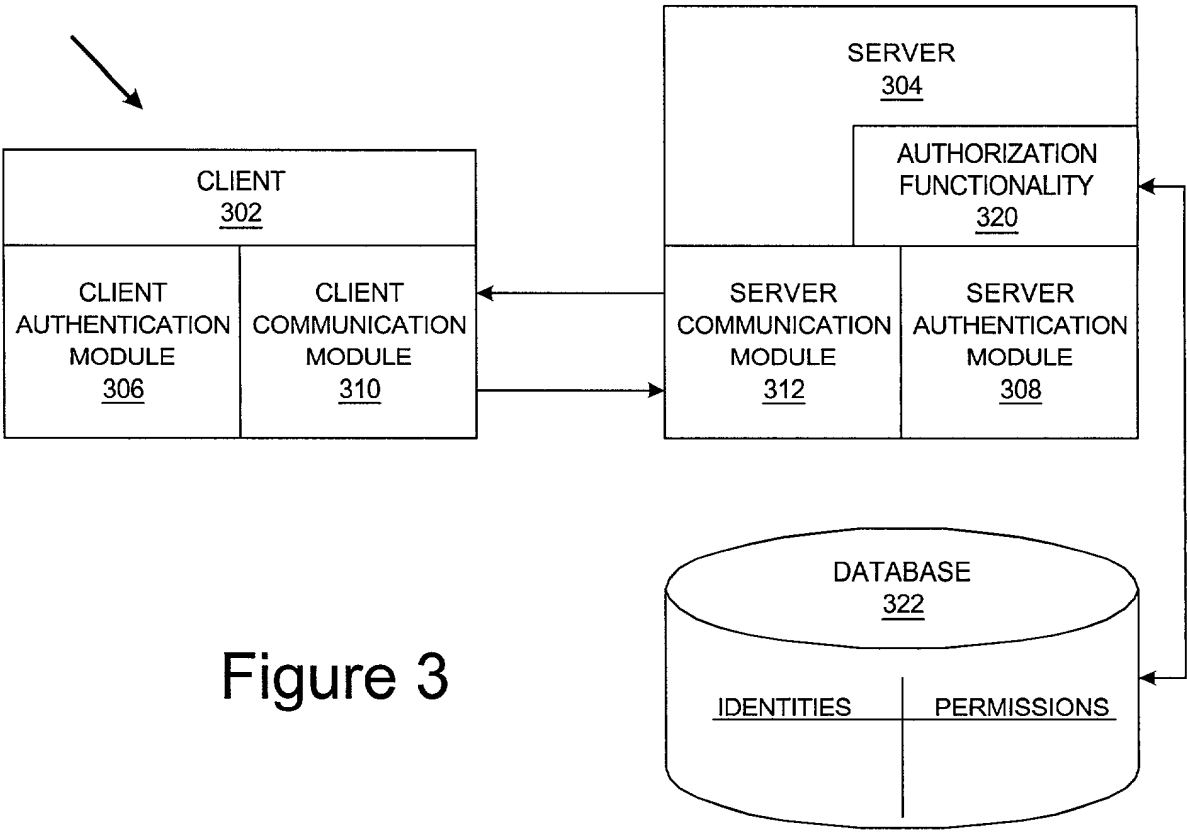


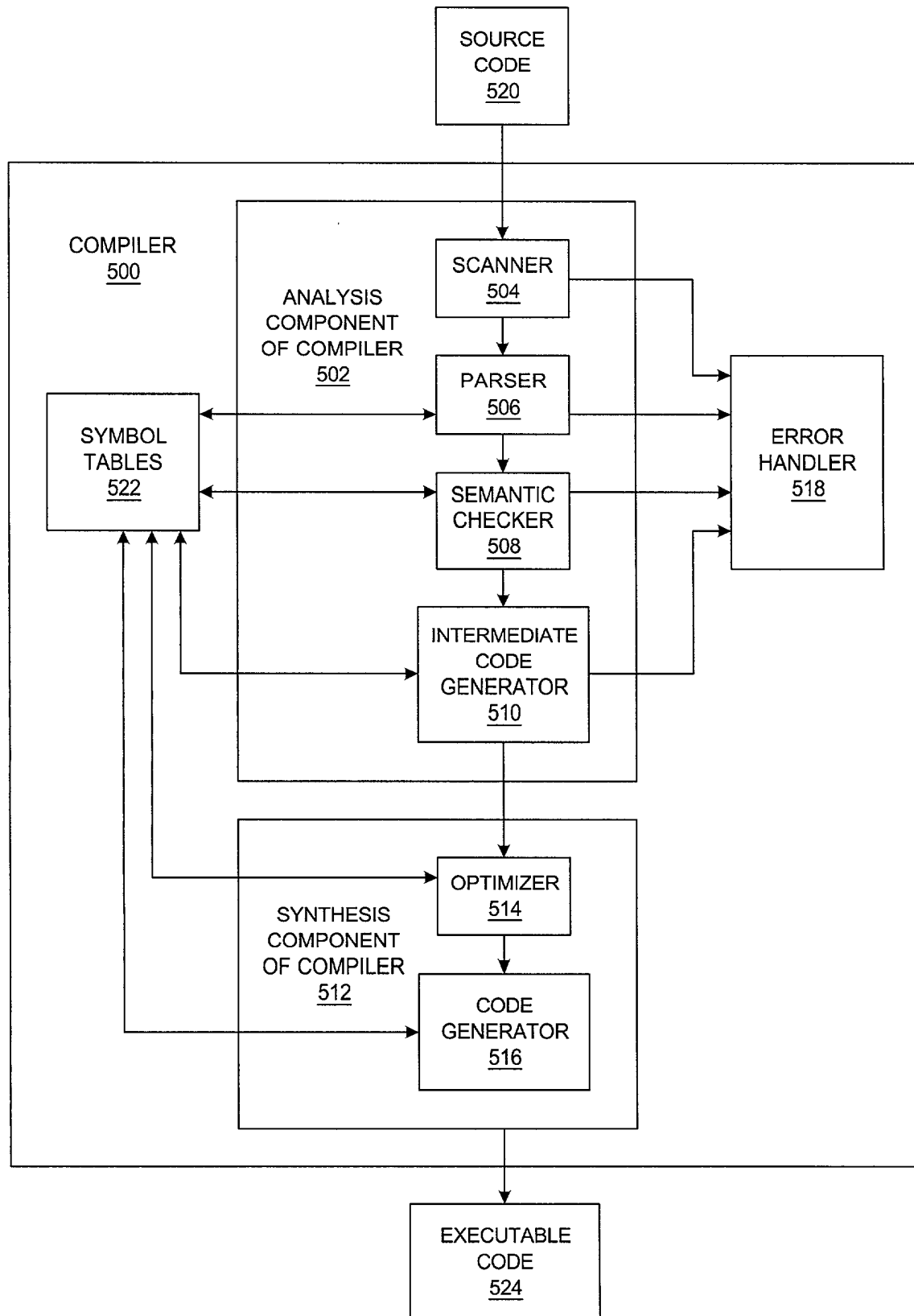
Figure 3

402 {
Class public ClientClassA {
 Method A {
 try {
 ServerClassM.M(); // Might throw an authorization exception.
 // Try block successfully executes when
 // invoked by entity with proper authority,
 // such as BankManager
 }
 catch (AuthException e)
 {
 // Codepath not reached for BankManager role
 }
 }
}
404 {
Class public ClientClassB {
 Method B {
 try {
 ServerClassM.M(); // Might throw an authorization exception.
 // Try block fails to execute when invoked
 // by entity with improper authorization,
 // such as BankTeller
 }
 catch (AuthException e)
 {
 // Codepath reached for BankTeller role
 }
 }
}
406 {
Class public ServerClassM {
408 — Method M () enforces ManagerAuthorization.AuthMethod
 }
Class public ManagerAuthorization {
 Method AuthMethod () throws AuthException {
 // Body of AuthMethod containing authorization process
 }
}

Figure 4A

402 {
Class public ClientClassA {
 Method A {
 try {
 ServerClassM.M(); // Might throw an authorization exception.
 // Try block successfully executes when
 // invoked by entity with proper authority,
 // such as BankManager role
 }
 catch (AuthException e)
 {
 // Codepath not reached for BankManager role
 }
 }
}
404 {
Class public ClientClassB {
 Method B {
 try {
 ServerClassM.M(); // Might throw an authorization exception.
 // Try block fails to execute when invoked
 // by entity with improper authorization,
 // such as BankTeller role
 }
 catch (AuthException e)
 {
 // Codepath reached for BankTeller role
 }
 }
}
410 {
Class public ServerClassM enforces ManagerAuthorization.AuthMethod { — 412
 Method M () {
 }
}
Class public Manager Authorization {
 Method AuthMethod () throws AuthException {
 }
}

Figure 4B



Prior Art

Figure 5

dec → classdec
 classdec → **class** class_id **extends** class_id { { class_field } }
 602 — classdec → **class** class_id **extends** class_id **enforces** authMethod { { class_field } }

class_field → vardec
 class_field → method

608 — method → **method** id(tyfields) **enforces** authMethod

method → **method** id(tyfields) = exp
 604 — authMethod → **method** id(tyfields) = exp

method → **method** id(tyfields):type_id = exp
 606 — authMethod → **method** id(tyfields):type_id = exp

exp → **new** class_id
 exp → lvalue id()
 exp → lvalue id(exp {, exp})

Figure 6

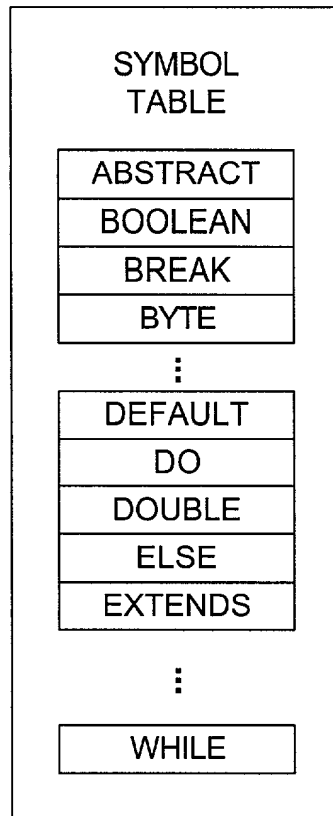


Figure 7A

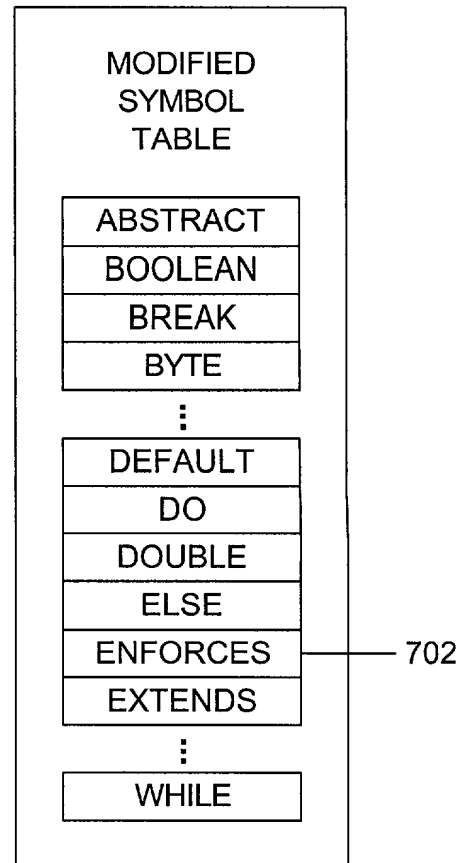


Figure 7B

802 — class CC extends Object {

method A () = { SC:M() }

}

804 — class SC extends Object enforces ACLClass:R {

method M () = { body of M }

method F () = { body of F }

}

806 — class SC extends Object {

method M () enforces ACLClass:R = { body of M }

method F () = { body of F }

}

808 — class SCSC extends SC {

method M () = { body of M }

}

Figure 8

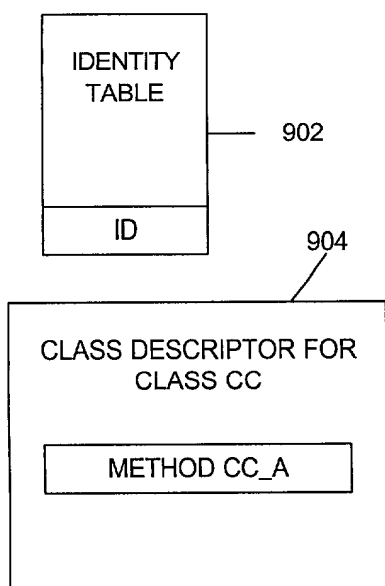


Figure 9A

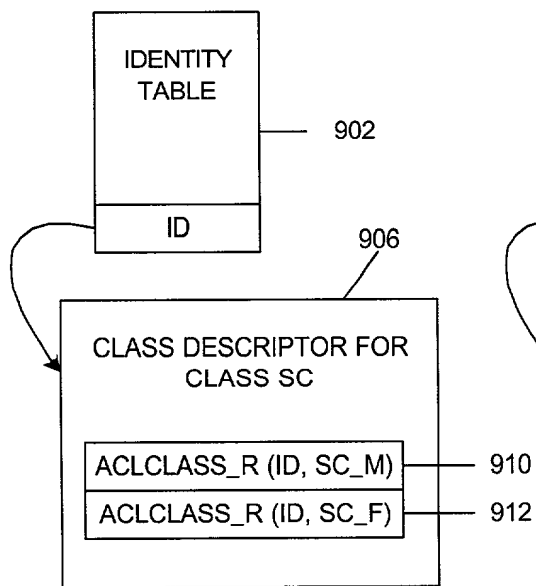


Figure 9B

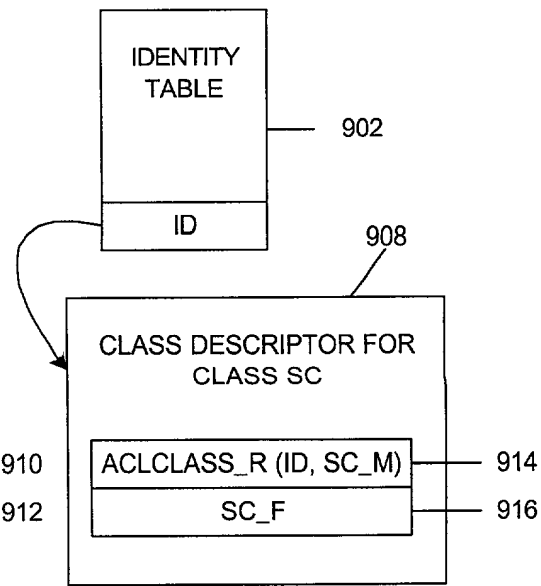


Figure 9C

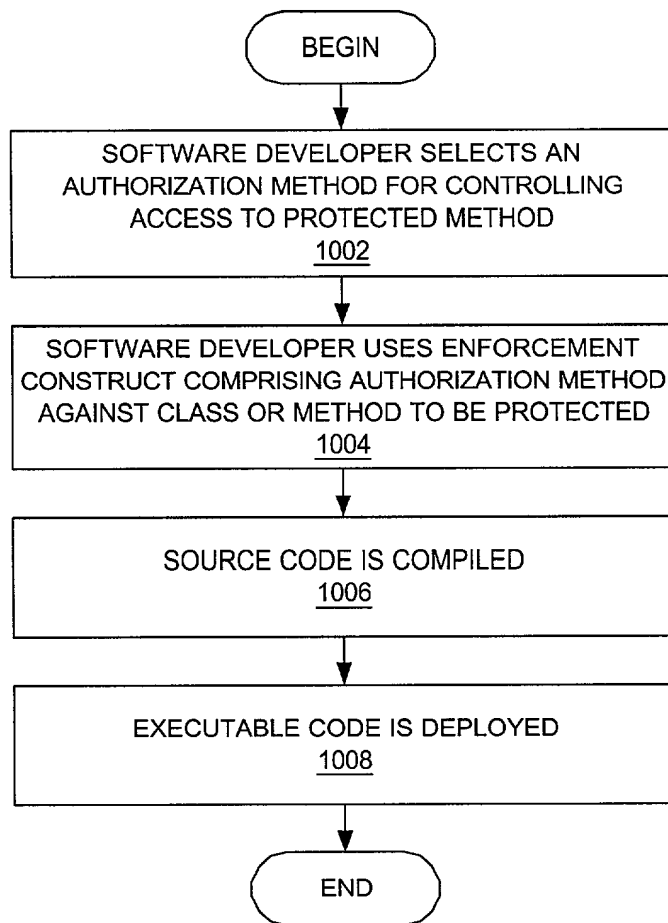


Figure 10A

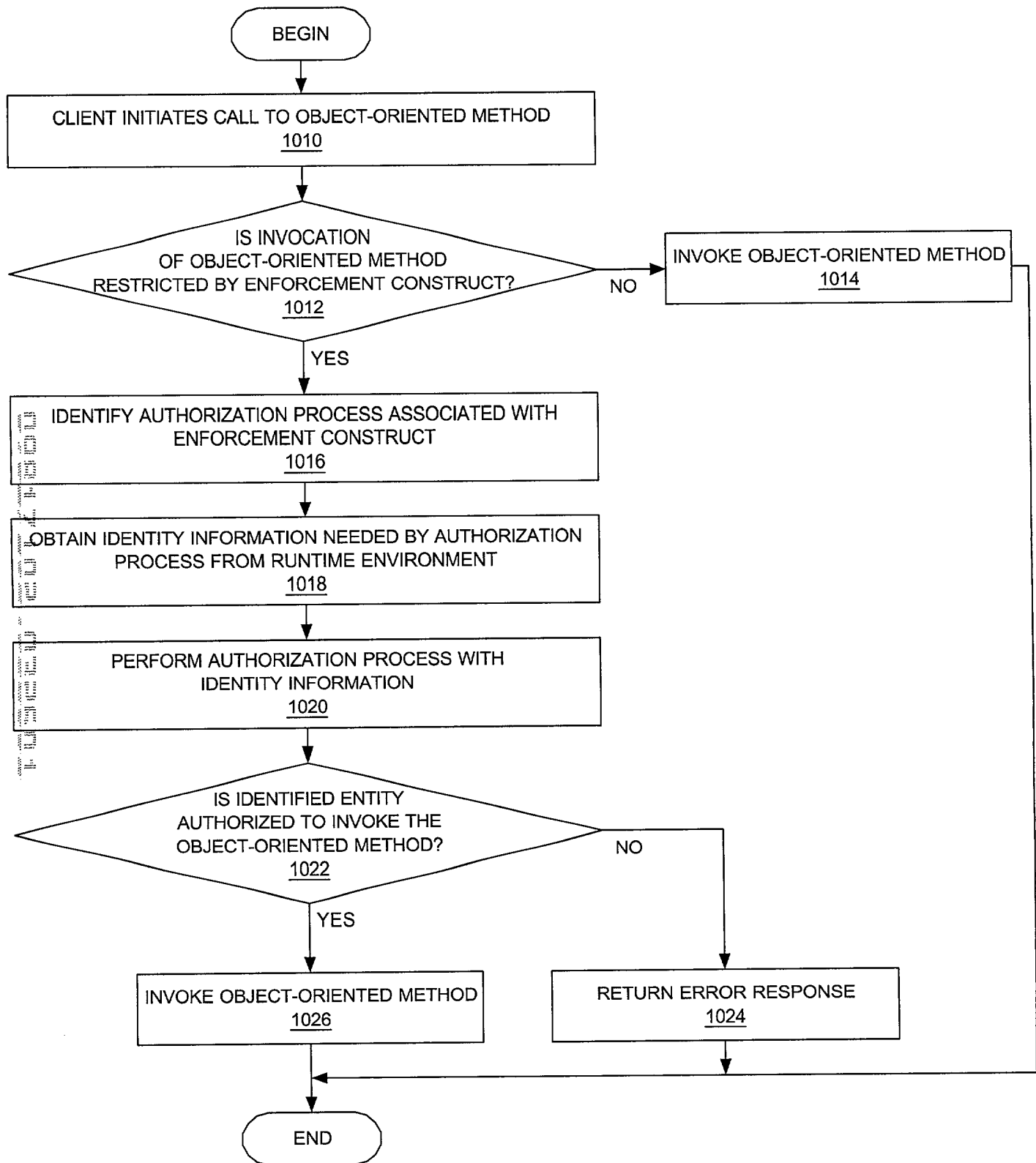


Figure 10B